KUMARAGURU
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Register Number: ……..

B.E DEGREE EXAMINATIONS: NOV 2015

(Regulation 2009)

Seventh Semester (Fast Track)

ELECTRICAL AND ELECTRONICS ENGINEERING

EEE352: Power Quality

Time: Three Hours **Maximum Marks: 100**

Answer all the Questions:-

PART A (10 x 1 = 10 Marks)

1. In long duration variations, the variation of the RMS voltage from its nominal value for a time
   a) 60 sec b) Greater than 60 sec
   c) Less than 60 sec d) 30 sec
2. Primary frequency component of a medium frequency oscillatory transients
   a) 5Hz b) Less than 5kHz
   c) Between 5 and 500kHz d) Greater than 500kHz
3. A temporary increase in the RMS value of the voltage of more than 10% of the nominal voltage is known as
   a) Sag b) Swell
   c) Voltage flicker d) transient
4. The overhead lines are protected from lightning by using
   a) Shield wire b) Ground wire
   c) High pass filter d) Low pass filter
5. Ratio of peak value to RMS value
   a) Load factor b) Crest factor
   c) Power factor d) Form factor

6. Ratio between RMS value of the harmonic and the RMS value of the fundamental

a) Total demand distortion
b) Total harmonic distortion
c) Harmonic
d) Harmonic index

7. Which one of the following is not a device used for controlling the harmonic distortion

a) Series reactor
b) Zigzag transformer
c) SVC
d) Passive filter

8. IEEE standard recommended practice for monitoring electrical power quality

a) IEEE std 519-1992
b) IEEE std 1159-1995
c) IEEE std P1346 -1998
d) IEEE std 1050-1989

9. Which instrument is used for the analysis and measurement of signal throughout the electromagnetic spectrum

a) Spectrum analyzer
b) Harmonic analyzer
c) Oscilloscope
d) Data logger

10. Spectrum analyzers covering up to 100kHz are called as

a) Spectrum analyzer
b) Harmonic analyzer
c) Distortion analyzer
d) Disturbance analyzer

PART B (10 x 2 = 20 Marks)

11. Distinguish between sag and swell.
12. Define the terms (i) Interharmonic (ii) DC offset
13. What is the need of surge arrester?
14. Give the cable life equation as a function of impulses.
15. Define Total Harmonic Distortion.
16. What are the main sources of resonance in power system?
17. Name any two IEEE standards for Power Quality.
18. What are the importances of grounding?
19. List the objectives of power quality monitoring system.
20. Mention the Instruments used for the analysis of non-sinusoidal voltage and currents.

PART C (5 x 14 = 70 Marks)

21.	a)	(i)	Explain briefly about voltage sags and voltage swells.	(7)
		(ii)	Explain about voltage sags caused by motor starting sags.	(7)
			(OR)	
	b)		Discuss in detail about the Computer Business Equipment Manufacture Associations (CBMEA) Explain about the events described in the curve.	
22.	a)	(i)	Discuss in detail about surge arrestors and surge suppressors for over voltage protection.	(8)
		(ii)	What is Ferro resonance and state the causes?	(6)
			(OR)	
	b)	(i)	Explain about the underground cable system protection.	(7)
		(ii)	Elaborate the following. (a) Low pass filter (b) Power conditioner.	(7)
23.	a)	(i)	Explain briefly about the phenomena of how current distortion affects the voltage distortion under the presence of harmonics.	(7)
		(ii)	Discuss briefly about the harmonic sources from commercial loads.	(7)
			(OR)	
	b)	(i)	Examine the power system response characteristic under the presence of harmonics.	(7)
		(ii)	Explain about the harmonic source location in power system network.	(7)
24.	a)		Explain in detail about the effects of harmonic distortion on various equipments in a power system.	
			(OR)	
	b)	(i)	Explain briefly about harmonic controlling devices used in power system network	(7)
		(ii)	Discuss about isolated grounding with necessary diagram.	(7)

25. a) Discuss in detail about flicker meter with block diagram.

(OR)

b) Describe the application of expert system for power quality monitoring.